

Amendments to the Specification

Please amend the paragraph [0002] beginning on page 1, as follows:

[0002]

2. Description of the Related Art

The related art battery pack is arranged such that an elementary battery cell is received in an outer case. The outer case insulates and protects the metal case of the cell. This battery pack is prepared by receiving an elementary battery cell in an outer case prepared by molding a plastic. This structure requires many producing steps that add to the production cost. In recent years, a production method has been developed which comprises inserting a cell in an outer case at a step of forming an outer case. This battery pack is disclosed in Patent Reference-4 JP-A-2000-315483, the content of which is incorporated herein by reference. This battery pack is prepared by temporarily fixing a battery core pack having a holder and a cell connected to each other in a mold for forming a molded resin product which is an outer case, and then inserting and fixing the core pack in the outer case thus formed. In order to prepare this battery pack, it is not necessary that the core pack be received in a separately formed outer case during assembly. Therefore, this battery pack can be mass-produced efficiently.

Please delete paragraph [0003] beginning on page 2:

[0003]

———~~[Patent Reference 1]~~

———~~JP A 2000 315483~~

Please amend the paragraph [0005] beginning on page 3, as follows:

[0005]

Further, the method which comprises inserting the battery core pack partly in the mold at the step of forming the outer case to produce a battery pack is

disadvantageous in that it is difficult to cover the surface of the cell by the outer case. In particular, it is extremely difficult to cover the surface of the cell by a thin outer case. This is because the thickness of the cell has an error that differs from position to position. For example, a thin battery cannot have a completely flat surface on the both sides. For example, a thin battery which is bent such that it protrudes at the center thereof is thicker at the center thereof than at the edge thereof. When a molten plastic is then injected into the mold for forming the outer case for covering the both sides of the battery with such a cell temporarily fixed in the forming chamber of the mold, the resulting outer case is thinner at the position corresponding to the thick portion of the thin battery or the surface of the thin battery is partly exposed to the exterior of the outer case, giving-producing defectives. It may be thought likely that this trouble can be eliminated by forming a thicker outer case for covering the both sides of the thin battery. However, it is actually not possible to form a thicker outer case. This is because the thicker the outer case is, the thicker is the entire battery pack. The production of thin batteries requires an extreme technique for raising the charge capacity while minimizing the external size. The cell thus produced should not be received in a thick outer case to form a battery pack having a large external size. Therefore, in the battery pack produced by inserting a battery core pack in an outer case, the thin battery is not insulated by the outer case on the both sides thereof. A label is bonded to the both sides of the cell so that the cell is insulated. The bonding of such a label requires the cost of the label and the cost of bonding the label, adding to the production cost.

Please amend the paragraph [0006] beginning on page 4, as follows:

[0006]

The invention has been worked out for the purpose of eliminating these disadvantages of the related art battery pack. An important object of the invention is to provide a battery pack which can be mass-produced efficiently in a high yield at a reduced cost using a simple producing apparatus and a process for the production

thereof.

Another important object of the invention is to provide a battery pack which can be covered and insulated on ~~the~~ both sides thereof by a thin plastic protective layer having a uniform thickness even if the external size of the cell has an error.

Please amend the paragraph [0009] beginning on page 6, as follows:

[0009]

In the battery pack of the invention, a holder having an output terminal attached thereto at a predetermined position can be fixed to the end of the cell. In this battery pack, with the periphery of the holder following the periphery of the cell, the polyurethane emulsion is spread over the area extending from the periphery of the cell to the periphery of the holder so that a plastic protective layer is bonded to the periphery of the cell and the holder and the holder and the cell are connected to each other at their border with the plastic protective layer. The holder can be bonded and fixed to the cell. The holder may be also fixed to the cell with a rivet. A protective element may be provided so as to be interposed between the holder and the cell.

Please amend the paragraph [0020] beginning on page 12, as follows:

[0020]

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a battery pack according to an embodiment of ~~implementation~~ of the invention;

Fig. 2 is an exploded perspective view of ~~the~~ a core pack of the battery pack shown in Fig. 1;

Fig. 3 is a sectional view illustrating how the core pack of a battery is dipped in an adhesive solution;

Fig. 4 is an enlarged perspective view of a holder;
 Fig. 5 is a rear perspective view of the holder shown in Fig. 4;
 Fig. 6 is an exploded perspective view of the holder shown in Fig. 4;
 Fig. 7 is an exploded perspective view of the holder shown in Fig. 5;
 Fig. 8 is a perspective view illustrating how an output terminal is attached to the second holder shown in Fig. 6;
 Fig. 9 is a rear perspective view of the second holder shown in Fig. 8;
 Fig. 10 is an exploded perspective view illustrating an example of the structure of connection between a holder and a cell;
 Fig. 11 is a sectional view illustrating the structure of connection between a holder and a cell shown in Fig. 10;
 Fig. 12 is an exploded perspective view illustrating another example of the structure of connection between a holder and a cell;
 Fig. 13 is a sectional view illustrating the structure of connection between a holder and a cell shown in Fig. 12;
 Fig. 14 is a sectional view illustrating another example of how the core pack of a battery is coated with the adhesive solution; and
 Fig. 15 is a sectional view illustrating a further example of how the core pack of a battery is coated with the adhesive ~~solution~~; solution.

Please amend the paragraph [0021] beginning on page 13, as follows:

~~THE DETAILED DESCRIPTION OF THE PREFERRED~~ PREFERRED EMBODIMENTS
 [0021]

The battery pack shown in the perspective view of Fig. 1 and the exploded perspective view of Fig. 2 comprises a holder 4 having an output terminal 3 fixed to a cell 2 at the end thereof having a protruding electrode portion 2B. Referring to this battery pack, a core pack 5 comprising the holder 4 attached to the cell 2 is dipped in an adhesive solution 20 so that the cell 2 and the holder 4 are coated with the adhesive

solution 20. The adhesive solution 20 is then cured to form a plastic protective layer 1 which covers the surface of the cell 2. The core pack 5 of the battery is dipped upright in the adhesive solution 20 with the cell 2 disposed down and the holder 4 disposed upside as shown in Fig. 3 so that the surface of the cell 2 and the holder 4 are coated with the adhesive solution 20. The cell 2 is coated with the adhesive solution 20 on the entire surface thereof exposed on the surface of the battery pack. In the case of the battery pack shown, the cell 2 is coated with the adhesive solution 20 on the periphery and the lower surface thereof. The holder 4 is coated with the adhesive solution 20 on the periphery thereof. Since the battery pack shown has terminal windows 6 provided on the side of the holder 4, the adhesive solution 20 is spread over the cell so that the adhesive solution 20 doesn't close the terminal windows 6.

Please amend the paragraph [0022] beginning on page 14, as follows:

[0022]

A perspective view of the holder 4 is shown in Figs. 4 and 5. Fig. 5 is a perspective diagram of the holder 4 of Fig. 4 as viewed from the other side. The holder 4 shown in these drawings comprises a first holder 4A, a second holder 4B fitted in the first holder 4A and output terminals 3 fixed so as to be interposed between the first holder 4A and the second holder 4B as shown in the exploded perspective views of Figs. 6 and 7. Fig. 7 is a perspective diagram of the holder 4 of Fig. 6 as viewed from the other side. Further, Figs. 8 and 9 each are a perspective view illustrating how the output terminals 3 are attached to the second holder 4B. Fig. 9 is a perspective diagram of the second holder 4B of Fig. 8 as viewed from the other side.

Please amend the paragraph [0024] beginning on page 15, as follows:

[0024]

The first holder 4A is obtained by molding a plastic in such an arrangement that the side wall 7 of a cylinder is closed at one end and opened at the other. The side wall 7 is closed on the side thereof opposed to the cell 2 and opened on the other side. The side wall 7 is formed in a cylindrical shape following the periphery of the cell 2 and its periphery is substantially flush with that of the cell 2. The first holder 4A has terminal windows 6 provided therein. ~~The~~ Each of the terminal windows 6 ~~each are~~ is an opening in which the power terminal of an electric appliance is inserted to make electrical connection to the output terminals 3 and have the output terminal 3 provided therein. The holder 4 ~~shown~~ has output terminals 3 provided thereinside to allow the insertion of the power terminals of an electrical appliance into the interior thereof, making it possible to prevent the output terminals 3 of the battery pack from being stained. Further, the contact of metal pieces with the output terminals 3 causing short-circuiting can be prevented. Moreover, since the output terminals 3 are provided in the holder 4, stain or change of properties can be prevented ~~to advantage~~.

Please amend the paragraph [0025] beginning on page 16, as follows:

[0025]

The second holder 4B is obtained by molding a plastic into an outer shape that can be fitted in the first holder 4A. The second holder 4B has a fixing portion 8 at which it is fixed to the cell 2. The second holder 4B shown has a fixing portion 8 provided at both ~~the~~ ends thereof. The arrangement ~~that~~ in which the fixing portion 8 is fixed to the cell 2 is shown in Figs. 10 to 13. The second holder 4B of Figs. 10 and 11 is fixed to the cell 2 by bonding the fixing portion 8 to the cell 2. The cell 2 has a connecting indentation 9 provided at the end of the electrode for bonding the fixing portion 8 of the holder 4 to the cell 2. The cell 2 shown has a ring groove-shaped connecting

indentation 9 provided at the end of the electrode. The connecting indentation 9 is undercut in such an arrangement that the opening is narrower than the bottom. The second holder 4B has a connecting protrusion 10 provided at the fixing portion 8 which is fitted in the connecting indentation 9. The second holder 4B is fixed to the cell 2 by inserting the connecting protrusion 10 provided at the fixing portion 8 into the connecting indentation 9 of the cell 2 and then bonding them to each other.

Please amend the paragraph [0026] beginning on page 17, as follows:

[0026]

Further, the second holder 124B shown in Figs. 12 and 13 is fixed to the cell 122 at a fixing portion 128 with a rivet 1211. The cell 122 to which the second holder 124B is fixed with the rivet 1211, ~~too,~~ also has a connecting indentation 129 provided at the end of the electrode. The connecting indentation 129, too, is undercut in such an arrangement that the opening is narrower than the bottom. The rivet 1211 comprises a cylindrical sheath 1211A which is inserted in the connecting indentation 129 of the cell 122 and a press-fit pin 1211B which is inserted in the interior of the sheath 1211A. The sheath 1211A comprises a lower part having an outer shape substantially the same as the inner shape of the connecting indentation 129 which gradually increases in wall thickness toward the lower end thereof and has an axial slit 1211a provided at the lower part thereof. The second holder 124B has a through-hole 1212 provided at the fixing portion 128 through which the sheath 1211A of the rivet 1211 is inserted in the cell 122 to connect the second holder 124B to the cell 122. In these drawings, the reference numeral 1216 indicates a sealing plate.